AIR COND, REFRIG, & HEAT (401)

401-300. Refrigeration Servicing. (2 Credits)
Discover the basic procedures for the diagnosis and repair of mechanical and electrical problems common to vapor-compression refrigeration systems. Become familiar with fractional and multiple horsepower systems that employ standard heat-absorbing and heat-rejecting components.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=300)

401-305. Air Cond Refr Fundamentals. (2 Credits)
This class will cover the fundamentals of the refrigeration cycle including the pressure enthalpy diagram. The students will also learn about the tools specific to the HVAC-R trade and well as working safely.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=305)

401-306. Air Cond Refr Controls. (1 Credit)
This class will cover the basics of electricity and electrical circuits as they apply to air conditioning. Students will also learn about the tools and meters used when working with electricity. There will be a strong emphasis on safety when working around electricity.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=306)

401-307. Air Conditioning Installation. (2 Credits)
This class will cover the basics of installing air conditioning systems. Students will learn about all aspects of installation including working with copper tubing, sheet metal, sizing equipment and the different equipment using in air conditioning.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=307)

401-308. Air Conditioning Air Flow. (1 Credit)
This class will cover the basics of air flow related to air conditioning. The student will become familiar with the tools related to testing and adjusting air flow in air conditioning systems. The students will also learn about system layout and duct design.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=308)

401-309. Commercial Refrigeration I. (2 Credits)
Study refrigeration principles, the refrigeration cycle and refrigerants in this course, the first of four in the commercial refrigeration service progression.
Prerequisites: 413-310 (may be taken concurrently) with a minimum grade of C-
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=309)

401-311. Commercial Refrigeration II. (2 Credits)
Examine topics such as automatic controls, diagram reading, troubleshooting and electric motors. Develop an understanding of the sequence of operation on all-weather systems packaged units and split systems, and discuss indoor air quality, air distribution and balancing during this 72-hour, 18-week course.
Prerequisites: (401-309 with a minimum grade of C- and 413-310 with a minimum grade of C-)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=311)

401-312. Commercial Refrigeration III. (2 Credits)
Explore the following topics: water-cooled condensing, commercial ice-making machines, electric and hot gas defrosts, heat pumps and electrical control systems.
Prerequisites: (401-311 with a minimum grade of C-)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=312)

401-313. Commercial Refrigeration IV. (2 Credits)
Study topics such as troubleshooting, commercial freezers and coolers, piping techniques and parallel rack systems.
Prerequisites: (401-312 with a minimum grade of D-)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=313)

401-314. Heating Systems Fundamentals. (2 Credits)
Students will learn fundamentals of heating systems. After learning theories of heating systems in the classroom, students will analyze furnaces in HVAC lab using hand and power tools. Students will learn safe operation of hand and power tools.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=314)

401-315. Heating Systems Application. (2 Credits)

401-316. Air Conditioning Application. (2 Credits)
This class will cover the application of different types of air conditioning equipment. The student will also learn about the efficiency of modern equipment. The students will also learn about working safely.
Prerequisites: 401-305 (may be taken concurrently) with a minimum grade of C and 401-306 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=316)

401-317. Heat Pumps. (1 Credit)
This class will cover air-source and geothermal heat pumps. The students will learn the specific techniques needed when working with heat pumps. Service, installation and an overview of design will be covered in this class.
Prerequisites: 401-305 (may be taken concurrently) with a minimum grade of C and 401-306 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=317)

401-318. Piping for HVAC. (1 Credit)
In this class the students will learn about the various types of pipe and tubing used in the HVAC industry. Students will learn of the various methods of layout, fabrication and joining piping and tubing. There will be an emphasis on safety related to the piping trades.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=318)

401-319. Air Cond Troubleshooting. (2 Credits)
This class will cover the basics of troubleshooting air conditioning systems. Students will learn how to determine sequence of operation and how to formulate a systematic approach to troubleshooting air conditioning systems. There will be a strong emphasis on safety when working around electricity.
Prerequisites: 401-305 (may be taken concurrently) with a minimum grade of C and 401-306 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=319)

401-320. Electricity for HVAC. (3 Credits)
Students will learn safe and applied AC and DC principles as well as correct use of testing equipment to include multimeters, control circuits, symbols, diagrams, protection devices, transformers, relays, thermostats, capacitors, control components and their applications to HVAC service and installation.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=320)

401-321. Psychrometrics. (1 Credit)
This class will cover the science of air. The students will learn that there is more to air conditioning then cooling. The goal of this class is to take the students to the next level when it comes to solving air conditioning problems.
Prerequisites: 401-305 (may be taken concurrently) with a minimum grade of C and 401-308 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=321)

401-322. Heating Systems Fundamentals. (2 Credits)
This class will cover the fundamentals of heating systems. The students will learn about the physics of heating and the basics of combustion. The students will also learn about the tools specific to the HVAC-R trade and well as working safely.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=322)

401-323. Heating Controls. (1 Credit)
This class will cover the basics of electricity and electrical circuits that apply to heating equipment and systems. Students will also learn about the tools and meters used when working with electricity. There will be a strong emphasis on safety when working around electricity.
Prerequisites: 401-322 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=323)

401-324. Forced Air Htg System Install. (2 Credits)
This class will cover the basics of installing forced air heating systems. Students will learn about all aspects of installation including sheet metal, gas piping and PVC venting, sizing equipment and the different equipment using in forced air heating systems.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=324)

401-325. HVAC Plan & Print Reading. (3 Credits)
Students will learn and apply interpreting of drawings and schematics related to installation and maintaining HVAC systems.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=325)

401-326. Hydronic Htg System Install. (1 Credit)
This class will cover the basics of installing hydronic heating systems. Students will learn about all aspects of installation including piping, gas piping and venting, sizing equipment and the different equipment using in hydronic heating systems.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=326)

401-327. Heating System Application. (2 Credits)
This class will cover the application of different types of heating equipment, residential and commercial. The student will also learn about the efficiency of modern equipment. The students will also learn about working safely.
Prerequisites: 401-322 (may be taken concurrently) with a minimum grade of C and 401-323 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=327)

401-328. Advanced HVAC Controls. (1 Credit)
This class will cover advanced electrical devices and electrical circuits related to hydronic heating systems. Students will continue to learn about the tools and meters used when working with electricity. There will be a strong emphasis on safety when working around electricity.
Prerequisites: 401-322 (may be taken concurrently) with a minimum grade of C and 401-323 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=328)

401-329. Heating Sys Troubleshooting. (1 Credit)
This class will cover the basics of troubleshooting various heating systems. Students will learn how to determine sequence of operation and how to formulate a systematic approach to troubleshooting heating systems. There will be a strong emphasis on safety when working around electricity.
Prerequisites: 401-322 (may be taken concurrently) with a minimum grade of C and 401-323 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=329)

401-330. Basic HVAC Mechanical Systems. (3 Credits)
Students will learn and apply skills related to HVAC application regarding hand and power tools, benching, brazing, black pipe, and basic sheet metal.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=330)

401-331. HVAC Design. (2 Credits)
This class will cover the many aspects of designing HVAC systems. The students will learn plan and print reading, heat loss/gain calculations and many aspects of various system designing.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=331)

401-332. Commercial HVAC. (1 Credit)
This class will cover the basics of commercial heating and air conditioning systems. Students will learn about the equipment used in the commercial HVAC field. There will be a strong emphasis on safety.
Prerequisites: 401-322 (may be taken concurrently) with a minimum grade of C and 401-323 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=332)

401-333. Survey of HVAC. (1 Credit)
This course will provide an introductory survey of the Heating, Ventilating, and Air Conditioning service and repair occupations.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=333)

401-334. HVAC Applications. (1 Credit)
Students will apply theories and principles of HVAC to install and troubleshoot typical residential HVAC equipment.
Prerequisites: 401-333 with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=334)

401-335. Air Conditioning Fundamentals. (3 Credits)
Air conditioning fundamentals, terms, principles of air movement and humidity related to safely controlling facility and equipment installation and maintenance will be studied and applied.
Prerequisites: (401-340 (may be taken concurrently) with a minimum grade of C-)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=335)

401-340. Refrigeration Fundamentals. (3 Credits)
Students will learn and apply terms, thermodynamics, refrigerants, vapor compression cycles, mechanical refrigeration components, electric controls and refrigerant tools and materials.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=340)

401-345. Refrigeration Applications. (3 Credits)
Students will learn and apply residential and commercial refrigeration systems, applications, installation, troubleshooting and servicing.
Prerequisites: (401-340 (may be taken concurrently) with a minimum grade of C-)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=345)

401-350. Fundamentals of Heating System. (3 Credits)
Students will learn and apply heating principles, temperature measurement, fuels, combustion, venting, exhaust systems, and design and operation of heating systems.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=350)

401-355. Heating Systems Applications. (3 Credits)
Students will learn and apply skills to safely install, start up and service gas and oil heating equipment, air conditioning, and heat pump systems.
Prerequisites: (401-350 (may be taken concurrently) with a minimum grade of C-)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=355)

401-375. Alternative Energy Systems. (1 Credit)
The theory of design, cost and return on investment related to photovoltaic, wind, hydro and bio gas electrical systems will be studied.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=375)

401-380. Geothermal Systems. (1 Credit)
Students will learn the concepts of geothermal heating and cooling to include geothermal pumps, ground source heat exchangers, ground source and indoor heat exchangers and circulating fluid configuration.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=380)

401-418. HVAC Refrigeration. (5.6 Credits)
Basic principles of refrigeration and their application in HVAC/Refrigeration. Development of basic skills required for installation, maintenance, and servicing HVAC/Refrigeration equipment.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=401&num=418)